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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,547	03/23/2004	Chiaki Aoyama	IIP-115-A	2570
21828 7590 04/25/2007 CARRIER BLACKMAN AND ASSOCIATES 24101 NOVI ROAD SUITE 100 NOVI, MI 48375			EXAMINER RASHID, DAVID	
			ART UNIT	PAPER NUMBER
			2609	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/25/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/25/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/806,547

Applicant(s)

AOYAMA, CHIAKI

Examiner

David P. Rashid

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 6, 8 - 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 10 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/23/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

All of the examiner's suggestions presented herein below have been assumed for examination purposes, unless otherwise noted.

Election/Restrictions

1. Applicant's election with traverse of the restriction requirement in the reply filed on 2/22/2007 is acknowledged. The traversal is on the grounds that

(i) all of the pending claims are drawn to related aspects of a single inventive concept, and should be not subject to restriction;

(ii) all of the pending claims are drawn to closely associated inventions, and would not require separate searches;

(iii) if the generic claim is allowed at a future date, it will then become necessary to bring all other claims related to that generic claim back into the application; and

(iv) that all examination of the entire application would not place a serious burden on the Examiner.

Though respectfully considered, these reasons above are not found persuasive because all pending claims are not drawn to related aspects of a single inventive concept since it has been determined by the Office that claims 1-8, 10, and 11 are classified under 382/154 (Invention I) and claim 9 is classified under 702/95 (Invention II). Invention I also contains separate two patentably distinct species. Separate classifications would ultimately require separate searches, and would thus place a serious burden on the examiner.

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The requirement is still deemed proper and is therefore made FINAL.

2. Claims 6, 8, and 9 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to both a nonelected invention and species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 2/22/2007.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file – Japanese Patent Application No. 2003-103498, filed 4/7/03, and Japanese Patent Application No. 2003-110466, filed 4/15/03.

Amendments

4. This office action is responsive to the preliminary claim and specification amendment received on March 23, 2004.

Drawings

5. The drawings are objected to under 37 CFR 1.83(a) because they fail to show subject matter as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d).

(i) FIG. 10 contains empty boxes that fail to show subject matter as described in the specification – suggest placing text:

“image input module” within reference numeral box 10;

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“pixel position module” within reference numeral box 20; and

“calculation module” within reference numeral box 40.

(ii) FIG. 14 contains empty boxes that fail to show subject matter as described in the specification – suggest placing text:

“image input module” within reference numeral box 210;

“pixel position module” within reference numeral box 220;

“calculation module” within reference numeral box 240; and

“calibration table” within reference numeral box 231.

(iii) FIG. 15 shows laser beam LB without properly labeling it as supported in the specification, and may create confusion as to exactly where the laser beam is in FIG. 15 – suggest properly labeling the laser beam “LB”.

6. The following is a quote from 37 CFR 1.84(q):

Lead lines are those lines between the reference characters and the details referred to. Such lines may be straight or curved and should be as short as possible. They must originate in the immediate proximity of the reference character and extend to the feature indicated.

7. FIG. 10 is objected to under 37 CFR 1.84(q) for failing to assign one reference character per lead line, as shown with “C(C_1)”, “C(C_2)”, “31(31a)”, and “31(31b)” – suggest placing a dashed box around both cameras C_1 and C_2 and labeling the dashed box “C”, and placing a dashed box around both camera calibration tables 31a and 31b and labeling the dashed box “31”.

8. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure

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must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action

Specification Suggestions

9. The following is a suggestion to the specification: page 3, paragraph [006], line 1: switching the words "above" and "described".

Specification Objections

10. The disclosure is objected to because of the following informalities:
- (i) Page 23, paragraph [103], line 2 contains a typo – suggest changing to "...calculating the three-dimensional position..."
- Appropriate correction is required.
11. The spacing of the lines of the specification at the following locations is such as to make reading difficult:
- (i) Page 12, paragraph [054], equations starting with "A", "B", and "C".
 - (ii) Page 28, paragraph [124], equations starting with "C_x", "C_y", and "C_z".
- New application papers with lines 1½ or double spaced on good quality paper are required.

Claim Rejections - 35 USC § 101

12. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

Claim 7 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 7 defines a "computer program" embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the

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function of the descriptive material to be realized” – Guidelines Annex IV). That is, the scope of the presently claimed “computer program” can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on “computer-readable medium” or equivalent in order to make the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

14. **Claim 1** is rejected under 35 U.S.C. 102(b) as being anticipated by Taniguchi (US 6,312,859 B1).

Regarding **claim 1**, Taniguchi discloses a method for measuring a position of an object (FIG. 1; Col. 4, lines 57 - 64) captured by a camera unit (A camera is a device used to capture images. The projection exposure apparatus of FIG. 1 is a camera unit in reference to Col. 10, lines 58 – 11.), the method comprising the steps of:

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calculating a discrepancy of an incident beam of light penetrating a lens systems (FIG. 1, elements 7, 10) of the camera unit relative to an optical center of the lens system (FIG. 4A, element delta L; Col. 11, lines 36 - 52); and

compensating the position of the object according to the discrepancy (FIG. 1, elements 13, 14; FIG. 4A, elements P2, 12; Col. 11, lines 36 - 52), Taniguchi does not teach using an image of the object captured by a camera unit and using the lens system of the camera unit (instead of the Taniguchi lens system apparatus) to calculate the discrepancy.

15. **Claims 2, 3, 5, and 7** are rejected under 35 U.S.C. 102(b) as being anticipated by Tanabata et al. (2002/0196422 A1).

Regarding **claim 2**, Tanabata discloses a method for measuring a position of an object (FIG. 1, paragraph [0028]) with a combination of an image of the object captured by a camera unit (FIG. 1, FIG. 10A, element 200) and calibration information (FIG. 9), the calibration information being prepared in advance in such a manner that a position of a measurement pixel of the image is correlated with a direction of an incident beam of light (FIG. 1, element 350; paragraph[0042], FIG. 9, FIG. 10) and a displacement from a reference point to the incident beam (FIG. 10, element d), the method comprising the steps of:

- (a) incorporating the image (FIG. 1, elements 310, 330);
- (b) detecting a position of a pixel representative of the object in the image incorporated at step (a) (FIG. 10B, elements 52a, 52b, d); and
- (c) calculating the position of the object according to the direction and the displacement of the incident beam (FIG. 1, element 350; paragraph [0041]), which are obtained from the

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calibration information with reference to the position of the pixel detected at step (b) (FIG. 9, paragraph [0042]).

Regarding **claim 3**, Tanabata discloses an apparatus for measuring a position of an object (FIG. 1, paragraph [0028]) according to an image of the object captured by a camera unit (FIG. 1, element 310; FIG. 10A, element 200), the apparatus comprising:

an image input means (FIG. 1, elements 310, 330) for incorporating the image;

a pixel position detection means (FIG. 10B, elements 52a, 52b, d) for detecting a position of a pixel representative of the object in the image incorporated by the image input means;

a storage means (FIG. 1, element 350; paragraph [0042]) for storing calibration information which correlates the position of the pixel with both a direction of an incident beam of light originating from the object (FIG. 9, y-axis) and a displacement from a reference point to the incident beam (FIG. 9, x-axis); and

a position calculation means (FIG. 1, element 350) for calculating the position of the object according to the direction (FIG. 10A shows varying horizontal positions to the fixed camera 200) and the displacement of the incident beam (paragraph [0041]), which are derived from the calibration information with reference to the position of the pixel detected by the pixel position detection means (“interpolation calculation” in paragraph [0049]).

Regarding **claim 5**, Tanabata discloses the apparatus according to claim 3, wherein the pixel position detection means (FIG. 10B, elements 52a, 52b, d) detects the position of the pixel representative of the object (paragraph [0044]) have a marker (FIG. 10A, element 51; FIG. 10B, element 52) identifying a typical spot of the object.

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Regarding **claim 7**, claim 2 recites identical features as in the computer program for a computer used for an apparatus of claim 7 (paragraph [0039]). Thus, references/arguments equivalent to those presented above for claim 2 is equally applicable to claim 7.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. **Claims 10 and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination between Taniguchi (US 6,312,859 B1) and Tanabata et al. (2002/0196422 A1).

Regarding **claim 10**, while the combination of Taniguchi in view of Tanabata disclose the method for measuring a position of an object according to claim 1, the combination does not teach wherein the discrepancy calculating step involves use of calibration information prepared in advance, wherein the method further involves generating the calibration information in the steps of:

projecting a beam of light on individual pixels of a camera image;

according to the beam of light incident on each pixel, calculating a displacement from a reference point to the incident beam of light; and

generating the calibration information by correlating a direction and the displacement of the incident beam of light with a position of each pixel.

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Tanabata discloses a distance measuring method and image input device with distance measuring function (FIG. 1) that teaches wherein the discrepancy calculating step involves use of calibration information prepared in advance (FIG. 1, element 350; Col. 5, lines 56 - 60), wherein the method further involves generating the calibration information in the steps of:

- projecting a beam of light on individual pixels of a camera image (FIG. 1, elements 240, 241);

- according to the beam of light incident on each pixel, calculating a displacement from a reference point to the incident beam of light (FIG. 10B, elements 52, d; Col. 6, lines 56 - 64); and

- generating the calibration information by correlating a direction (FIG. 9, y-axis) and the displacement (FIG. 9, x-axis) of the incident beam of light with a position of each pixel.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the combination of Taniguchi in view of Tanabata to include the discrepancy calculating step involving use of calibration information prepared in advance as taught by Tanabata so that "...a distance may be obtained by substituting the displacement into the calculation equation.", Tanabata, Col. 5, lines 60 - 62, wherein the method further involves generating the calibration information in the steps of:

- projecting a beam of light on individual pixels of a camera image;

- according to the beam of light incident on each pixel, calculating a displacement from a reference point to the incident beam of light; and

- generating the calibration information by correlating a direction and the displacement of the incident beam of light with a position of each pixel as taught by Tanabata "...to provide a distance measuring technology capable of stably and accurately performing distance

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measurement of an object with out any highly accurate focus control mechanism...”, Tanabata, Col. 2, lines 2 – 5.

Regarding **claim 11**, while the combination of Taniguchi in view of Tanabata disclose the method for measuring a position of an objecting according to claim 1, the combination does not teach wherein the method further involves generating the calibration information in the steps of:

adjusting a first direction of the camera unit so that a first peak intensity of light emitted by a light source falls in a measurement pixel captured by the camera unit, and measuring a first relative position of the light source relative to the camera unit;

adjusting a second direction of the camera unit so that a second peak intensity of light emitted by the light source falls in the measurement pixel, and measuring a second relative position of the light source relative to the camera unit;

repeating determination of an incident beam of light impinging on the measuring pixel according to the first and second relative positions for predetermined measurement pixels;

calculating a displacement from a reference point to the incident beam of light for each of the measurement pixels; and

generating the calibration information which correlates a direction and the displacement of the incident beam of light with each of the measurement pixels.

Tanabata discloses a distance measuring method and image input device with distance measuring function (FIG. 1) that teaches wherein the method further involves generating the calibration information in the steps of:

adjusting a first direction of the camera unit so that a first peak intensity of light emitted by a light source falls in a measurement pixel captured by the camera unit, and measuring a first

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relative position of the light source relative to the camera unit (FIG. 10A, elements D, 50a, 51a; paragraph [0044]);

adjusting a second direction of the camera unit so that a second peak intensity of light emitted by the light source falls in the measurement pixel, and measuring a second relative position of the light source relative to the camera unit (FIG. 10A, elements D1, 50b, 51b; paragraph [0044]);

repeating determination of an incident beam of light impinging on the measuring pixel according to the first and second relative positions for predetermined measurement pixels (paragraph [0045]; paragraph [0046]);

calculating a displacement from a reference point to the incident beam of light for each of the measurement pixels (FIG. 10B, element d); and

generating the calibration information which correlates a direction (FIG. 9, y-axis) and the displacement (FIG. 9, x-axis) of the incident beam of light with each of the measurement pixels (FIG. 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the combination of Taniguchi in view of Tanabata to include wherein the method further involves generating the calibration information in the steps of:

adjusting a first direction of the camera unit so that a first peak intensity of light emitted by a light source falls in a measurement pixel captured by the camera unit, and measuring a first relative position of the light source relative to the camera unit;

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adjusting a second direction of the camera unit so that a second peak intensity of light emitted by the light source falls in the measurement pixel, and measuring a second relative position of the light source relative to the camera unit;

repeating determination of an incident beam of light impinging on the measuring pixel according to the first and second relative positions for predetermined measurement pixels;

calculating a displacement from a reference point to the incident beam of light for each of the measurement pixels; and

generating the calibration information which correlates a direction and the displacement of the incident beam of light with each of the measurement pixels as taught by Tanabata "...to provide a distance measuring technology capable of stably and accurately performing distance measurement of an object with out any highly accurate focus control mechanism...", Tanabata, Col. 2, lines 2 – 5.

18. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination between Tanabata et al. (2002/0196422 A1) and Day et al. (US 4,639,878 A).

Regarding **claim 4**, while Tanabata discloses the apparatus according to claim 3, Tanabata does not teach wherein the camera unit comprises cameras in sets of at least two so as to take a plurality of images and the storage means stores the calibration information for each camera.

Day discloses a system for automatically determining the position and attitude of an object (FIG. 3) wherein the camera unit comprises cameras in sets of at least two (FIG. 3,

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element 26) so as to take a plurality of images (Col. 6, lines 65 - 66) and the storage means (FIG. 3, element 42) stores the calibration information for each camera (Col. 8, lines 20 - 24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the apparatus of Tanabata to include the camera unit comprising cameras in sets of at least two so as to take a plurality of images as taught by Day "...for automatically determining the position and attitude of a three-dimensional body...", Day, Col. 3, lines 66 - 68 and the storage means storing the calibration information for each camera as taught by Day for the computer 40 to access the information from the mass storage 42 for calculation purposes.

Conclusion

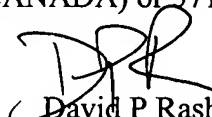
19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David P. Rashid whose telephone number is (571) 270-1578. The examiner can normally be reached on 7:30 - 17:00.

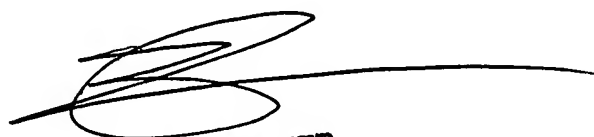
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner can be reached on (571) 272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

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like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


David P Rashid
Examiner
Art Unit 2112


BRIAN WERNER
SUPERVISORY PATENT EXAMINER